

THEORETISCH PHYSIKALISCHES KOLLOQUIUM

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Dynamical quantum phase transitions

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The theory of phase transitions plays a central role for the understanding of equilibrium physical systems. In this talk I will introduce a dynamical analogue in quantum many-body systems, termed dynamical quantum phase transitions, that occurs during coherent nonequilibrium real-time evolution. The recent achieved advances will be summarized starting from the first experimental observations in so-called quantum simulators such as ultracold atomic gases and trapped ions. I will furthermore discuss how important concepts of equilibrium criticality can be extended including scaling and universality as well as how these transitions can control the general dynamical properties.